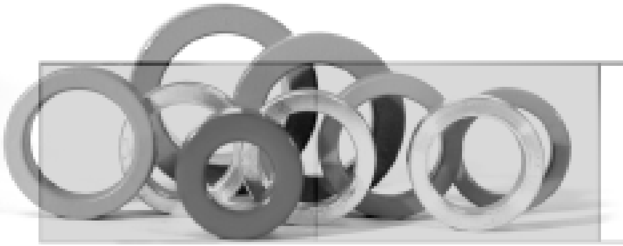
MAGNETICS®

STRIP WOUND CORES



www.mag-inc.com

Visit Magnetics' website for a wealth of easy to access information on soft magnetic cores and materials…

All product specifications for Magnetics' Ferrite Cores, Powder Cores and Strip Wound Cores can be found quickly by using the menu driven product locator.

Magnetics' Digital Library contains all of the company's technical bulletins, white papers and design manuals, which can be viewed on-screen or downloaded.

The Software section of the website provides access to the Magnetics' software design aids for designing Common Mode Filters, Current Transformers, Inductors and MagAmps.

Contact information for Magnetics' global distribution network, including access to STOCKCHECK, an easy way to check distributor inventory via the web.

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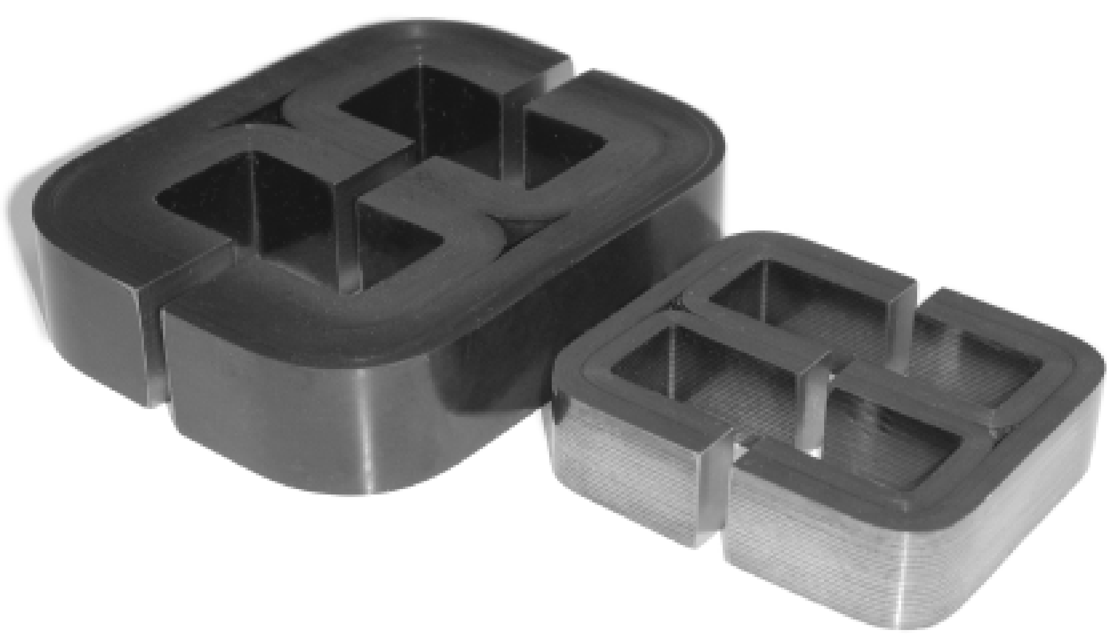

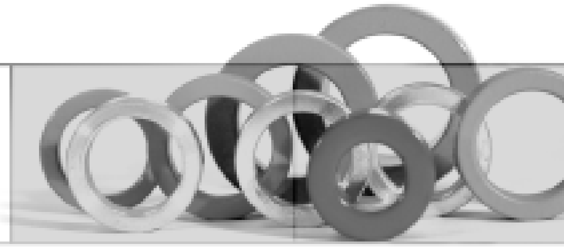

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ABOUT MAGNETICS

Magnetics offers the confidence of over fifty years of expertise in the research, design, manufacture and support of high quality magnetic materials and components.

A major supplier of the highest performance materials in the industry including: MPP, High Flux, Kool Mμ®, power ferrites, high permeability ferrites and strip wound cores, Magnetics' products set the standard for providing consistent and reliable electrical properties for a comprehensive range of core materials and geometries. Magnetics is the best choice for a variety of applications ranging from simple chokes and transformers used in telephone equipment to sophisticated devices for aerospace electronics.

Magnetics backs its products with unsurpassed technical expertise and customer service. Magnetics' Application Engineering staff offers the experience necessary to assist the designer from the initial design phase through prototype approval. The knowledgeable Sales staff is available to help with all of your customer service needs. This support, combined with a global presence via a worldwide distribution network, including sales offices in North America, Asia and Europe, and a Hong Kong distribution center, makes Magnetics a premier supplier to the international electronics industry.

INTRODUCTION

HISTORY OF THE STRIP WOUND CORE

Magnetics pioneered Strip Wound Cores.

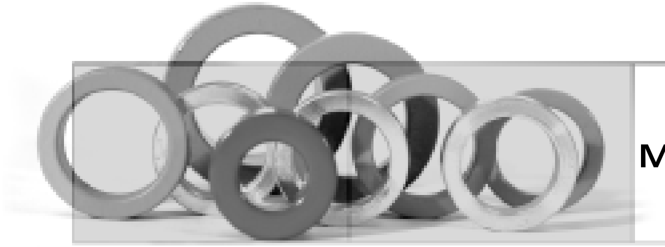
Although the groundwork for the formation of modern magnetic devices was laid by German military in World War I, it was after World War II that tape wound cores had their beginnings as electronics opened the way to new weapons systems. The Naval Ordnance Laboratory in Washington, DC turned its attention to facets of magnetism in devices where the vacuum tube had a serious drawback - fragility.

The Navy was constantly looking for a device with the vacuum tube's precise ability to control, but with none of its physical limitations. An old device, the magnetic amplifier, became the subject of a new study. Engineers and scientists assigned to this work began to dig deeply into the function the core plays, and particularly what could be done by using newer nickel-iron alloys. It was discovered that some alloys would reach saturation with very low magnetizing currents. This started the beginning of a new era for an old science - high permeability magnetics.

Magnetics was established in 1949 when the commercial market for high permeability magnetic materials was virtually non-existent and development in this field was just taking root. The new simplicity and reliability with which magnetic components could be used opened many doors in the field of electronics. Magnetics quickly was positioned as a leader in this field and has remained so ever since.

The first tape cores were used in applications where they were superior to the fragile vacuum tubes. Tape wound core applications grew rapidly because these new magnetic components performed far better due to environmental and operational advantages. They contained no parts to wear or burn out; and the effects of shock, vibration and temperature were small compared to other components. Tape cores also afforded the advantages of electrical isolation and signal mixing not easily obtainable from other electric parts.

Some of the magnetic devices in early applications have since been replaced by transistors and integrated circuits; however, a host of new applications and requirements for new core materials have emerged. Magnetic cores are often key parts of complicated electronic circuitry found in highly reliable airborne and space computers, telephone systems, radar installations, jet engine controls, power supplies and nuclear reactors.



MATERIALS AND APPLICATIONS

Magnetics offers soft magnetic core materials of saturating and high sensitivity magnetic circuits for all applications. These materials are especially selected and processed to meet exacting magnetic circuit requirements, and are manufactured to tight guaranteed tolerances according to IEEE test procedures or other common industry test methods.

SQUARE ORTHONOL
(MATERIAL CODE "A")

This material, a grain-oriented 50% nickel-iron alloy, is manufactured to meet exacting circuit requirements for very high squareness and high core gain, and is usually used in saturable reactors, high gain magnetic amplifiers, bistable switching devices, and power inverter-converter applications. Other applications such as time delays, flux counters and transductors demanding extremely square hysteresis loops require selection of Square Orthonol.

SQUARE PERMALLOY 80
(MATERIAL CODE "D")

This material, a non-oriented 80% nickel-iron alloy, is manufactured to meet the high squareness, and high core gain requirements of magnetic preamplifiers and modulators. It is especially useful in converters and inverters where high voltage at low power levels are required, but where circuit losses must be kept to a minimum. Square Permalloy 80 has a saturation flux density approximately 1/2 that of the Orthonol's, but has coercive force values 1/5 to 1/7 that of the 50% oriented nickel-iron alloys. Core gain for Square Permalloy 80 is higher by approximately 1.7 times the core gain of Orthonol.

SUPERMALLOY *(MATERIAL CODE "F")*

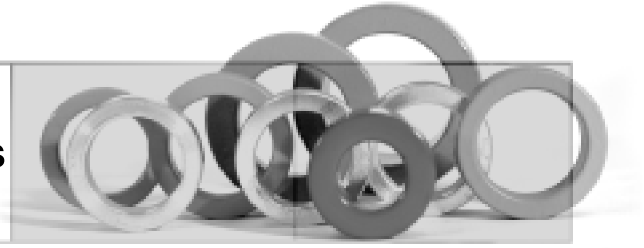
This material is a specially processed 80% nickel-iron alloy. It is manufactured to develop the ultimate in high initial permeability and low losses. Initial permeability ranges from 40,000 to 100,000 while the coercive force is about 1/3 that of Square Permalloy 80. Supermalloy is very useful in ultra-sensitive transformers, especially pulse transformers, and ultra-sensitive magnetic amplifiers where low loss is mandatory.

48 ALLOY *(MATERIAL CODE "H")*

This material, a 50% nickel-iron alloy, has a round B-H loop and exhibits lower saturation flux density, squareness, coercive force, and core gain than the Orthonol types. It is useful in devices requiring lower coercive force such as special transformers, saturable reactors, and proportioning magnetic amplifiers. AC core losses are typically lower than with Orthonol.

MAGNESIL *(MATERIAL CODE "K")*

This material, a grain-oriented 3% silicon-iron alloy, is processed and annealed to develop high squareness and low core loss. It is usually used in high quality toroidal power transformers, current transformers and high power saturable reactors and magnetic amplifiers. It exhibits high saturation flux density with high squareness but has comparatively high coercive force and core loss. With its high Curie temperature, it is quite useful in magnetic devices which are to be exposed to temperatures between 200ºC (392ºF) and 500ºC (932ºF). At higher temperatures, uncased cores should only be used due to case temperature limitations.



ROUND PERMALLOY 80
(MATERIAL CODE "R")

This material, a non-oriented 80% nickel-iron alloy, is processed to develop high initial permeability and low coercive force. It has lower squareness and core gain than the square type, as these characteristics are sacrificed to produce the high initial permeability and low coercive force properties. Round Permalloy 80 is especially useful in designing highly sensitive input and inter-stage transformers where signals are extremely low and DC currents are not present. It is also useful in current transformers where losses must be kept to a minimum and high accuracy is a necessity. The initial permeability of this material is usually between 20,000 and 50,000 with coercive force values about 70% that of Square Permalloy 80.

SUPERMENDUR *(MATERIAL CODE "S")*

This material, available in small quantity by special order, is a highly refined 50% cobalt-iron alloy. It is specially processed and annealed to develop high squareness and high saturation flux density. Supermendur serves well in devices requiring extreme miniaturization and high operating temperatures. It can be used in the same types of applications as Magnesil; however, due to its higher flux density (approximately 21,000 gausses), reduction in core size and weight may be accomplished. It has the highest Curie temperature of any of the available square loop alloys, so it will find applications in high temperature work.

Table 1 TYPICAL PROPERTIES OF MAGNETIC ALLOYS

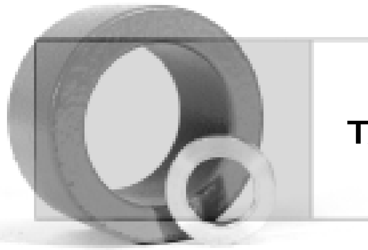
PROPERTY	3% Si-Fe Alloys (K)	50% Ni-Fe Alloys (A, H)	80% Ni-Fe Alloys (R, D, F)	50% Co-Fe Alloys (S)
% Iron	97	50	17	49
% Nickel	….	50	79	….
% Cobalt	….	….	….	….
% Silicon 3	….	….	….	5
% Molybdenum	….	….	4	….
% Other	….	….	….	2 V
Density (gms/cm3)	7.65	8.2	8.7	8.2
Melting Point (ºC)	1,475	1,425	1,425	1,480
Curie Temperature (ºC)	750	500	460	940
Specific Heat (Cal./ºCgm)	0.12	0.12	0.118	0.118
Resistivity (µΩ-cm)	50	45	57	26
CTE (x10-6/ºC)	12	5.8	12.9	9.9
Rockwell Hardness	B-84	B-90	B-95	B-98

Table 2 MAGNETIC CHARACTERISTICS COMPARISON*

Mat'l Code	Material Type	Flux Density		Br/Bm	Coercive Force 400 Hertz CCFR **	
		(kG)	(Teslas)		Oersteds	A/M
A	Square Orthonol	14.2 - 15.8	1.42 - 1.58	0.88 up	0.15 - 0.25	11.9 - 19.9
D	Square Permalloy 80	6.6 - 8.2	0.66 - 0.82	0.80 up	0.022 - 0.044	1.75 - 3.50
F	Supermalloy	6.5 - 8.2	0.65 - 0.82	0.40 - 0.70	0.004 - 0.015	0.32 - 1.19
H	48 Alloy	11.5 - 14.0	1.15 - 1.40	0.80 - 0.92	0.08 - 0.15	6.4 - 12.0
K	Magnesil	15.0 - 18.0	1.5 - 1.8	0.85 up	0.45 - 0.65	35.8 - 51.7
R	Round Permalloy 80	6.6 - 8.2	0.66 - 0.82	0.45 - 0.75	0.008 - 0.026	0.64 - 2.07
S	Supermendur	19.0 - 22.0	1.9 - 2.2	0.90 up	0.50 - 0.70	39.8 - 55.7

* *The values listed are typical of 0.002" thick materials of the types shown. For guaranteed characteristics on all thicknesses of alloys available, contact Magnetics Applications Engineering Department.*

** *400 Hertz CCFR Coercive Force is defined as the H1 reset characteristic described by the Constant Current Flux Reset Test Method in IEEE Std. #393.*



TAPE WOUND CORES

MAGNETICS Tape Wound Cores are made from high permeability magnetic strip alloys of nickel-iron (80% or 50% nickel in thicknesses from 0.0005" to 0.004"), and silicon-iron (in 0.004" thicknesses). Available in nylon cases, Tape Wound Cores are produced as small as 0.250" ID to more than 20" OD, in over 1,400 sizes.

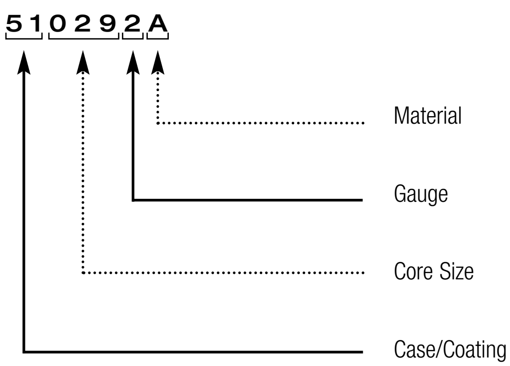
Applications

Magnetics Tape Wound Cores are often key components of:

- Aerospace applications
- Radar installations
- Jet engine controls
- Power supplies
- Nuclear reactors
- Other high reliability applications

How To Order

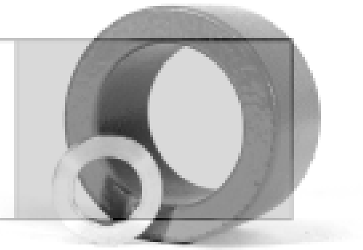
Each core is coded by a part number that describes it in detail. A typical part number is:



Below is a quick reference for available combinations of materials, cases, and gauges.

	Materials	Available Cases/Coatings*	Gauges (Thickness) 0.0005" (Gauge Code) (5)	0.001" (1)	0.002" (2)	0.004" (4)
A	(Square Orthonol)	50, 51, 52	X	X	X	X
D	(Square Permalloy 80)	50, 51, 52	X	X	X	X
F	(Supermalloy)	50, 51, 52	X	X	X	X
H	(Alloy 48)	50, 51, 52	X	X	X	X
K	(Magnesil)	50, 51, 52, 53, 54				X
R	(Round Permalloy 80)	50, 51, 52		X	X	X
S	(Supermendur)	50, 51, 52				X

***Cases/Coatings (Specifications on page 5)**
50 series – cores in non-metallic cases (phenolic or nylon depending on availability)
51 series – cores in aluminum cases
52 series – cores in aluminum cases with epoxy coating
53 series – uncased/bare cores
54 series – encapsulated/cores (red epoxy)



NON-METALLIC CASES
(CASE/COATING CODE "50")

For superior electrical properties, improved wearing qualities, and high strength, non-metallic cases are widely used as protection for the core material against winding stresses and pressures. Both phenolic and nylon types meet a minimum 2000 volt breakdown requirement. The glass-filled nylon types can withstand temperatures to 200ºC (392ºF) without softening, while the phenolic materials will withstand temperatures up to 125ºC (257ºF).

ALUMINUM CASES
(CASE/COATING CODE "51")

Aluminum core cases have great structural strength. A glass epoxy insert, to which the aluminum case is mechanically bonded, forms an airtight seal. These core cases will withstand temperatures to 200ºC (392ºF), a critical factor in designing for extreme environmental conditions. Also, the strong aluminum construction will prevent any distortion of the core case, thus preserving the guaranteed magnetic properties of the core within.

ALUMINUM CASE WITH GVB EPOXY PAINT
(CASE/COATING CODE "52")

This case is the same basic construction as the aluminum box, but in addition it has a thin, epoxy-type, protective coating surrounding the case. This finish adds no more than 0.0015" to the OD, subtracts no more than 0.015" from the ID, nor adds more than 0.020" to the height.

GVB epoxy paint finish offers a guaranteed minimum voltage breakdown of 1000 volts from wire to case. This coating will withstand temperatures as high as 200ºC (392ºF) and as low as -65ºC (-85ºF) with an operating life of 20,000 hours.

UNCASED/BARE CORES
(CASE/COATING CODE "53")

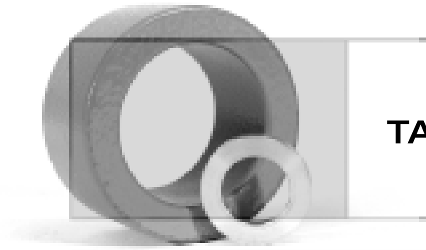
Because of the extreme sensitivity of nickel-iron cores to winding stresses and pressures, such cores are not available in an uncased state. Magnesil cores are not as susceptible to these pressures and are available without cases.

Uncased cores offer a maximum window area. They also offer a slightly smaller package and lower cost where slight deterioration of properties after winding and potting can be tolerated.

ENCAPSULATED (RED EPOXY) CORES
(CASE/COATING CODE "54")

Magnesil cores are available in encapsulated form. This protection is a tough, hard epoxy which adheres rigidly to the core, allowing the winder to wind directly over the core without prior taping. A smooth radius prevents wire insulation from being scraped.

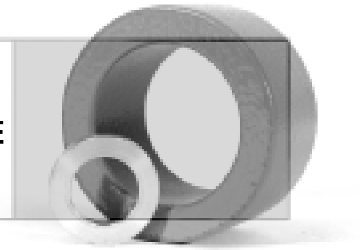
Encapsulated cores have a guaranteed minimum voltage breakdown of 1000 volts from core to winding. The temperature rating of this finish is 125ºC (257ºF) in free air.



TAPE WOUND CORES SIZE SELECTION GUIDE

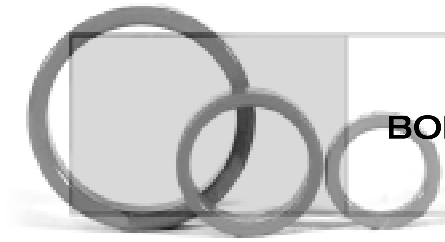
Tape Wound Cores Size and Selection Table (By Effective Core Area)

Core Part Number		Nominal Core Dimensions			Case Dimensions (Nylon)			Path Length cm	Effective Core Area (cm²)				Window Area cm²	WaAc cm⁴
		I.D.	O.D.	HT.	I.D. Min	O.D. Max	HT. Max		0.0005"	0.001"	0.002"	0.004"		
50402	in.	0.375	0.438	0.125	0.306	0.509	0.199	3.25	0.013	0.019	0.022	N/A	0.456	0.010
	mm.	9.5	11.1	3.2	7.8	12.9	5.0							
50107	in.	0.500	0.563	0.125	0.432	0.632	0.199	4.24	0.013	0.019	0.022	0.023	0.916	0.020
	mm.	12.7	14.3	3.2	11.0	16.0	5.0							
50356	in.	0.687	0.750	0.125	0.618	0.819	0.197	5.73	0.013	0.019	0.022	0.023	1.914	0.041
	mm.	17.0	19.0	3.2	15.7	20.8	5.0							
50153	in.	0.375	0.500	0.125	0.313	0.569	0.199	3.49	0.025	0.038	0.043	N/A	0.456	0.020
	mm.	9.5	12.7	3.2	8.0	14.4	5.0							
50154	in.	0.438	0.563	0.125	0.369	0.632	0.199	3.99	0.025	0.038	0.043	N/A	0.673	0.030
	mm.	11.1	14.3	3.2	9.4	16.0	5.0							
50056	in.	0.500	0.625	0.125	0.431	0.694	0.199	4.49	0.025	0.038	0.043	0.045	0.916	0.041
	mm.	12.7	15.9	3.2	10.9	17.6	5.0							
50057	in.	0.625	0.750	0.125	0.556	0.819	0.199	5.48	0.025	0.038	0.043	0.045	1.534	0.066
	mm.	15.9	19.0	3.2	14.1	20.8	5.0							
50155	in.	0.438	0.563	0.250	0.369	0.632	0.324	3.99	0.050	0.076	0.086	N/A	0.724	0.061
	mm.	11.1	14.3	6.4	9.4	16.0	8.2							
50000	in.	0.500	0.750	0.125	0.431	0.819	0.199	4.99	0.050	0.076	0.086	0.091	0.916	0.081
	mm.	12.7	19.0	3.2	10.9	20.8	5.0							
50002	in.	0.650	0.900	0.125	0.581	0.969	0.199	5.98	0.050	0.076	0.086	0.091	1.676	0.142
	mm.	16.5	22.9	3.2	14.8	24.6	5.0							
50011	in.	1.000	1.250	0.125	0.921	1.329	0.209	8.97	0.050	0.076	0.086	0.091	4.238	0.365
	mm.	25.4	31.8	3.2	23.4	33.8	5.3							
50748	in.	2.500	2.750	0.125	2.389	2.869	0.247	20.94	0.050	0.076	0.086	0.091	29.407	2.53
	mm.	63.5	69.9	3.2	60.7	72.9	6.3							
50176	in.	0.500	0.750	0.250	0.431	0.819	0.324	4.99	0.101	0.151	0.171	0.182	0.916	0.157
	mm.	12.7	19.0	6.4	10.9	20.8	8.2							
50033	in.	0.625	0.875	0.250	0.556	0.944	0.324	5.98	0.101	0.151	0.171	0.182	1.534	0.263
	mm.	15.9	22.2	6.4	14.1	24.0	8.2							
50061	in.	0.750	1.000	0.250	0.671	1.079	0.334	6.98	0.101	0.151	0.171	0.182	2.273	0.390
	mm.	19.0	25.4	6.4	17.0	27.4	8.5							
50004	in.	1.000	1.250	0.250	0.921	1.329	0.334	8.97	0.101	0.151	0.171	0.182	4.238	0.724
	mm.	25.4	31.8	6.4	23.4	33.8	8.5							
50076	in.	0.625	1.000	0.188	0.546	1.079	0.272	6.48	0.113	0.171	0.193	0.205	1.478	0.284
	mm.	15.9	25.4	4.8	13.9	27.4	6.9							
50106	in.	0.750	1.125	0.188	0.671	1.204	0.272	7.48	0.113	0.171	0.193	0.205	2.273	0.441
	mm.	19.0	28.6	4.8	17.0	30.6	6.9							
50296	in.	0.600	0.900	0.250	0.531	0.969	0.324	5.98	0.121	0.182	0.206	N/A	1.478	0.304
	mm.	15.2	22.9	6.4	13.5	24.6	8.2							
50323	in.	2.500	2.800	0.250	2.329	2.971	0.410	21.14	0.121	0.182	0.206	0.218	29.407	6.06
	mm.	63.5	71.1	6.4	59.2	75.5	10.4							
50007	in.	0.625	1.000	0.250	0.546	1.079	0.334	6.48	0.151	0.227	0.257	0.272	1.478	0.380
	mm.	15.9	25.4	6.4	13.9	27.4	8.5							
50084	in.	0.750	1.125	0.250	0.671	1.204	0.329	7.48	0.151	0.227	0.257	0.272	2.273	0.582
	mm.	19.0	28.6	6.4	17.0	30.6	8.4							
50029	in.	1.000	1.375	0.250	0.901	1.474	0.354	9.47	0.151	0.227	0.257	0.272	4.438	1.09
	mm.	25.4	34.9	6.4	22.9	37.4	9.0							
50168	in.	0.750	1.000	0.375	0.671	1.079	0.459	6.98	0.151	0.227	0.257	0.272	2.273	0.582
	mm.	19.0	25.4	9.5	17.0	27.4	11.6							



Tape Wound Cores Size and Selection Table (By Effective Core Area)

Core Part Number		Nominal Core Dimensions			Case Dimensions (Nylon)			Path Length cm	Effective Core Area (cm^2)				Window Area cm^2	WaAc cm^4
		I.D.	O.D.	HT.	I.D. Min	O.D. Max	HT. Max		0.0005"	0.001"	0.002"	0.004"		
50032	in	1.000	1.500	0.250	0.901	1.599	0.354	9.97	0.202	0.303	0.343	0.363	4.238	1.45
	mm.	25.4	38.1	6.4	22.9	40.6	9.0							
50030	in.	1.250	1.750	0.250	1.149	1.851	0.357	11.96	0.202	0.303	0.343	0.363	6.815	2.24
	mm.	31.8	44.4	6.4	29.2	47.0	9.1							
50391	in.	1.000	1.250	0.500	0.906	1.344	0.599	8.97	0.202	0.303	0.343	0.363	4.435	1.52
	mm.	25.4	31.8	12.7	23.0	34.1	15.2							
50094	in.	0.625	1.000	0.375	0.546	1.079	0.459	6.48	0.224	0.340	0.386	0.408	1.534	0.592
	mm.	15.9	25.4	9.5	13.9	27.4	11.6							
50034	in.	0.750	1.125	0.375	0.671	1.204	0.459	7.48	0.224	0.340	0.386	0.408	2.273	0.876
	mm.	19.0	28.6	9.5	17.0	30.6	11.6							
50181	in.	0.875	1.250	0.375	0.796	1.329	0.459	8.47	0.224	0.340	0.386	0.408	3.160	1.22
	mm.	22.2	31.8	9.5	20.2	33.8	11.6							
50504	in.	1.125	1.500	0.375	1.036	1.599	0.479	10.47	0.224	0.340	0.386	0.408	5.478	2.12
	mm.	28.6	38.1	9.5	26.3	40.6	12.2							
50133	in.	0.650	1.150	0.375	0.571	1.229	0.459	7.18	0.299	0.454	0.514	0.545	1.676	0.861
	mm.	16.5	29.2	9.5	14.5	31.2	11.6							
50188	in.	0.750	1.250	0.375	0.671	1.329	0.459	7.98	0.299	0.454	0.514	0.545	2.238	1.15
	mm.	19.0	31.8	9.5	17.0	33.8	11.6							
50383	in.	0.875	1.375	0.375	0.776	1.474	0.479	8.97	0.299	0.454	0.514	0.545	3.160	1.63
	mm.	22.2	34.9	9.5	19.7	37.4	12.2							
50026	in.	1.000	1.500	0.375	0.901	1.599	0.479	9.97	0.299	0.454	0.514	0.545	4.238	2.18
	mm.	25.4	38.1	9.5	22.9	40.6	12.2							
50038	in.	1.000	1.500	0.500	0.901	1.599	0.604	9.97	0.398	0.605	0.689	0.726	4.238	2.91
	mm.	25.4	38.1	12.7	22.9	40.6	15.3							
50035	in.	1.250	1.750	0.500	1.149	1.851	0.607	11.96	0.398	0.605	0.689	0.726	6.815	4.67
	mm.	31.8	44.4	12.7	29.2	47.0	15.4							
50055	in.	1.500	2.000	0.500	1.401	2.099	0.604	13.96	0.398	0.605	0.689	0.726	9.924	6.81
	mm.	38.1	50.8	12.7	35.6	53.3	15.3							
50345	in.	1.750	2.250	0.500	1.619	2.381	0.627	15.95	0.398	0.605	0.689	0.726	13.787	9.46
	mm.	44.4	57.2	12.7	41.1	60.5	15.9							
50017	in.	2.000	2.500	0.500	1.869	2.631	0.627	17.95	0.398	0.605	0.689	0.726	18.182	12.5
	mm.	50.8	63.5	12.7	47.5	66.8	15.9							
50425	in.	1.250	2.000	0.375	1.134	2.116	0.492	12.96	0.448	0.681	0.771	0.817	6.815	5.26
	mm.	31.80	50.8	9.5	28.8	53.7	12.5							
50555	in.	1.250	2.250	0.500	1.119	2.381	0.627	13.96	0.796	1.210	1.371	1.452	6.699	9.19
	mm.	31.8	57.1	12.7	28.4	60.5	15.9							
50001	in.	1.500	2.500	0.500	1.369	2.631	0.627	15.95	0.796	1.210	1.371	1.452	9.640	13.2
	mm.	38.1	63.5	12.7	34.8	66.8	15.9							
50103	in.	2.000	3.000	0.500	1.869	3.131	0.627	19.94	0.796	1.210	1.371	1.452	17.894	24.5
	mm.	50.8	76.2	12.7	47.5	79.5	15.9							
50128	in.	2.5	3.5	0.500	2.369	3.631	0.627	23.93	0.796	1.210	1.371	1.452	28.678	39.3
	mm.	63.5	88.8	12.7	60.2	92.2	15.9							
50451	in.	1.000	1.500	1.000	0.891	1.609	1.104	9.97	0.796	1.210	1.371	1.452	4.238	5.81
	mm.	25.4	38.1	25.4	22.6	40.9	28.0							
50040	in.	1.500	2.000	1.000	1.401	2.099	1.104	13.96	0.796	1.210	1.371	1.452	9.853	13.5
	mm.	38.1	50.8	25.4	35.6	53.3	28.0							
50042	in.	2.500	3.500	1.000	2.334	3.666	1.144	23.93	1.590	2.420	2.742	2.903	28.678	78.6
	mm.	63.5	88.9	25.4	59.3	93.1	29.0							
50120	in.	2.000	3.250	1.000	1.869	3.381	1.127	20.94	1.990	3.024	3.428	3.629	18.086	62.0
	mm.	50.8	82.6	25.4	47.5	85.9	28.6							



BOBBIN CORES

Magnetics Bobbin Cores are miniature tape cores made from ultra-thin (0.000125" to 0.001" thick) strip wound on non-magnetic stainless steel bobbins. Bobbin Cores are generally manufactured from Permalloy 80 and Orthonol®. Covered with protective caps and then epoxy coated, Bobbin Cores can be made as small as 0.05" ID and with strip widths down to 0.032". Bobbin Cores can switch from positive to negative saturation in a few microseconds or less, making them ideal for analog logic elements, magnetometers, and pulse transformers.

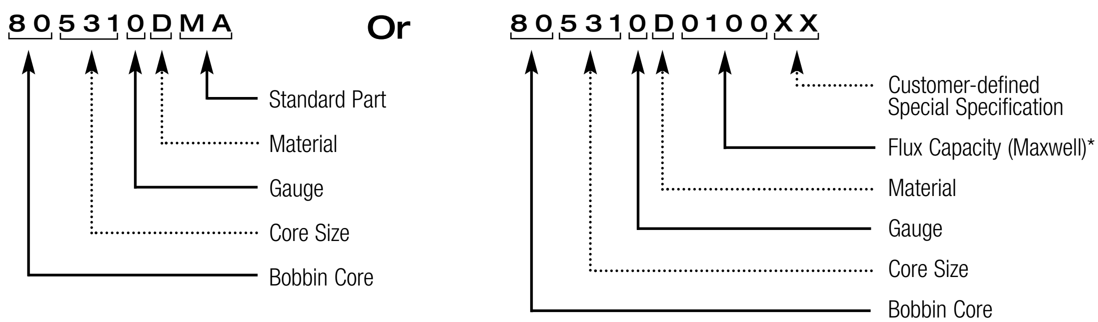
Applications

Because of their temperature stability, low coercive values and high saturation flux densities, as well as high peak permeabilities and high squareness, Magnetics Bobbin Cores are ideal for:

- High frequency magnetic amplifiers
- Flux gate magnetometers
- Harmonic generators
- Pulse transformers
- Current transformers
- Analog counters and timers

How To Order

Each miniature core is coded by a part number, which describes it:



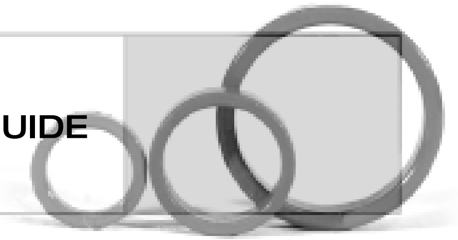
*** Flux capacity for Bobbin Cores is defined from negative remanance to positive saturation.**

Below is a quick reference for available combinations of materials and gauges.

Materials	Gauges (Thickness) 0.000125" (Gauge Code) (9)	0.00025" (0)	0.0005" (5)	0.001" (1)
A (Square Orthonol)		X	X	X
D (Square Permalloy 80)	X	X	X	X
F (Supermalloy)			X	X

Coating

GVB epoxy paint

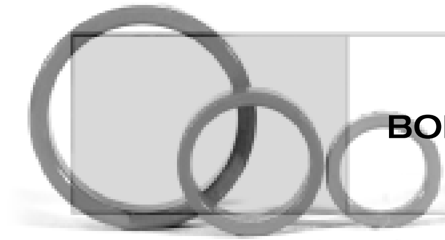


Bobbin Cores Size and Selection Table (By Height)

Core Part Number		Case Dimensions			Mean Length cm	Window Area cm^2	Permalloy 80 Flux Capacity (Maxwells)				Orthonol Flux Capacity (Maxwells)		
		I.D. Min	O.D. Max	HT. Max			.000125"	0.00025"	0.0005"	0.001"	0.00025"	0.0005"	0.001"
80512 (*)MA	in.	0.097	0.225	0.120	1.20	0.0506	30	50	80	100	100	160	200
	mm.	2.41	5.72	2.67									
80550 (*)MA	in.	0.128	0.255	0.120	1.45	0.0860							
	mm.	3.18	6.48	2.67									
80505 (*)MA	in.	0.160	0.290	0.120	1.70	0.137							
	mm.	4.06	7.37	2.67									
80512 (*)MA	in.	0.222	0.350	0.120	2.20	0.255							
	mm.	5.59	8.89	2.67			0.002	0.0033	0.0053	0.0066	0.0033	0.0053	0.0066
80529 (*)MA	in.	0.097	0.225	0.185	1.20	0.0506	60	100	160	200	200	320	400
	mm.	2.41	5.72	4.45									
80544 (*)MA	in.	0.125	0.255	0.185	1.45	0.0860							
	mm.	3.18	6.48	4.45									
80523 (*)MA	in.	0.160	0.290	0.185	1.70	0.137							
	mm.	4.06	7.37	4.45									
80530 (*)MA	in.	0.222	0.350	0.185	2.20	0.255							
	mm.	5.59	8.89	4.45									
80524 (*)MA	in.	0.285	0.415	0.185	2.70	0.425							
	mm.	7.24	10.54	4.45									
80531 (*)MA	in.	0.345	0.480	0.185	3.20	0.620							
	mm.	8.76	12.19	4.45									
80608 (*)MA	in.	0.405	0.540	0.185	3.70	0.850							
	mm.	10.29	13.72	4.45									

*Gauge and material

Additional sizes and modified flux capacities are available. Special processing for magnetometer applications is available. Contact a Magnetics Application Engineer.

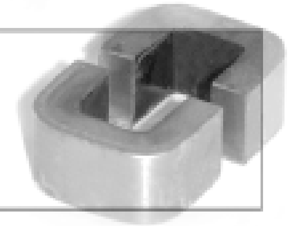


Bobbin Cores Size and Selection Table (by Height)

Core Part Number		Case Dimensions			Mean Length cm	Window Area cm^2	Permalloy 80 Flux Capacity (Maxwells)				Orthonol Flux Capacity (Maxwells)		
		I.D. Min	O.D. Max	HT. Max			0.000125"	0.00025"	0.0005"	0.001"	0.00025"	0.0005"	0.001"
80609 (*)MA	in.	0.470	0.605	0.185	4.20	1.14							
	mm.	11.94	15.37	4.45			0.004	0.0066	0.0105	0.0132	0.0066	0.0105	0.0132
80558 (*)MA	in.	0.222	0.385	0.185	2.30	0.255	90	150	240	300	300	480	600
	mm.	5.59	9.78	4.45									
80581 (*)MA	in.	0.285	0.445	0.185	2.80	0.425							
	mm.	7.24	11.30	4.45									
80610 (*)MA	in.	0.345	0.505	0.185	3.39	0.620							
	mm.	8.76	12.83	4.45			0.006	0.010	0.016	0.0198	0.010	0.016	0.0198
80611 (*)MA	in.	0.220	0.415	0.185	2.40	0.255	120	200	320	400	400	640	800
	mm.	5.59	10.54	4.45									
80598 (*)MA	in.	0.285	0.480	0.185	2.90	0.425							
	mm.	7.24	12.19	4.45									
80516 (*)MA	in.	0.345	0.540	0.185	3.40	0.620							
	mm.	8.76	13.72	4.45									
80612 (*)MA	in.	0.405	0.605	0.185	3.90	0.850							
	mm.	10.29	15.37	4.45									
80588 (*)MA	in.	0.470	0.665	0.185	4.40	1.14							
	mm.	11.94	16.89	4.45			0.008	0.0133	0.021	0.0264	0.0133	0.021	0.0264
80613 (*)MA	in.	0.285	0.510	0.185	3.00	0.425	150	250	400	500	500	800	1,000
	mm.	7.24	12.95	4.45									
80606 (*)MA	in.	0.345	0.570	0.185	3.50	0.620							
	mm.	8.76	14.48	4.45									
80614 (*)MA	in.	0.405	0.630	0.185	4.00	0.850							
	mm.	10.29	16.00	4.45									
80615 (*)MA	in.	0.470	0.695	0.185	4.50	1.14							
	mm.	11.94	17.65	4.45			0.010	0.0165	0.0265	0.033	0.0165	0.0265	0.033
80560 (*)MA	in.	0.217	0.385	0.320	2.30	0.245	180	300	480	600	600	960	1,200
	mm.	5.46	9.78	7.87									
80539 (*)MA	in.	0.280	0.445	0.320	2.80	0.410							
	mm.	7.11	11.30	7.87									
80517 (*)MA	in.	0.342	0.510	0.320	3.30	0.602							
	mm.	8.64	12.95	7.87									
80616 (*)MA	in.	0.400	0.570	0.320	3.80	0.830							
	mm.	10.16	14.48	7.87									
80617 (*)MA	in.	0.465	0.630	0.320	4.30	1.12							
	mm.	11.81	16.00	7.87			0.012	0.020	0.032	0.0395	0.020	0.032	0.0395
80600 (*)MA	in.	0.280	0.480	0.320	2.90	0.410	240	400	640	800	800	1280	1,600
	mm.	7.11	12.19	7.87									
80618 (*)MA	in.	0.340	0.540	0.320	3.40	0.602							
	mm.	8.64	13.72	7.87									
80619 (*)MA	in.	0.400	0.605	0.320	3.90	0.830							
	mm.	10.16	15.37	7.87									
80525 (*)MA	in.	0.465	0.665	0.320	4.40	1.12							
	mm.	11.81	16.89	7.87			0.016	0.0265	0.042	0.053	0.0265	0.042	0.053

*Gauge and material

Additional sizes and modified flux capacities are available. Special processing for magnetometer applications is available. Contact a Magnetics Application Engineer.



Magnetics Cut Cores and Special Cores are manufactured on a custom basis. Please contact Magnetics Application Engineers with your requirements. A special specification part number will be assigned at time of order.

CUT CORES

Magnetics Cut Cores are made from high permeability magnetic strip alloys of non-oriented nickel-iron Permalloy 80 (80% nickel in thicknesses from 0.001" to 0.004"), grain-oriented Orthonol (50% nickel in thicknesses from 0.001" to 0.004"), and highly refined Iron-Vanadium-Cobalt alloy Supermendur in 0.004" thickness. C and E Cut Cores are available in any practical size.

Magnetics Cut Cores are ideal for medium and low frequency high power applications, in which the losses or saturation of silicon iron are not acceptable. The small gap introduced in cutting results in a core that will not saturate due to slight imbalance on the primary and secondary windings.

Applications

Magnetics Cut Cores are often key components of:

- Power transformers
- Chokes
- Pulse transformers
- High power inductors

SPECIAL CORES

Magnetics Special Cores are available in many types and configurations. The following are capabilities within which these special parts can be produced.

Rectangular Cut Cores Specifications

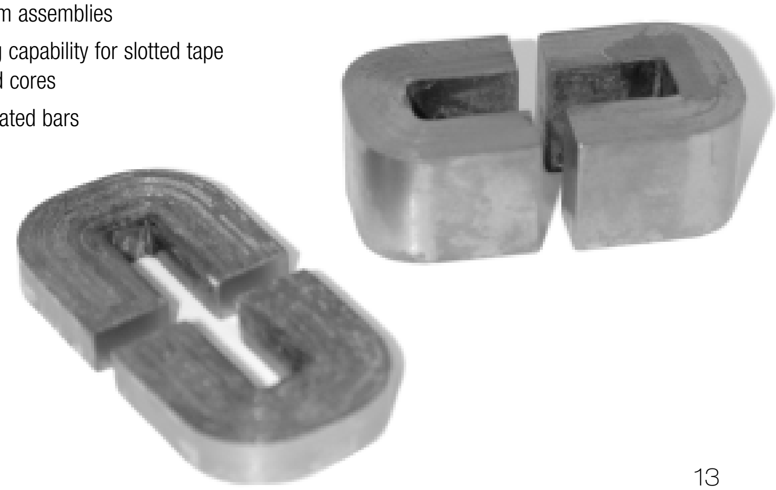
A. Tape Thickness - 0.0005" to 0.004"
B. Tape Width - 1/8" to 4"
C. Window Dimensions - 1/8" x 1/8" to 21" x 21"
D. Permalloy, Orthonol, Supermendur
E. Cutting
  1. Single cut through parallel legs
  2. Multiple cuts through parallel legs
F. Vacuum-impregnating up to 12".
G. Testing - Exciting current and watt loss to 10 kHz-square.

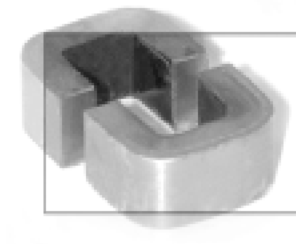
Toroidal Cores

A. Outside diameter-up to 36"
B. Cutting wheels available-0.008" to 0.062" thick
C. Smallest effective air gap after cutting and lapping – approximately 0.00025". Normal effective gap is 0.0005"
D. Multiple cuts to specific segment dimensions
E. Composite cores - eg. D material core nested inside A material core

Other Parts

A. Custom assemblies
B. Milling capability for slotted tape wound cores
C. Laminated bars





OTHER PRODUCTS FROM MAGNETICS

MPP, HIGH FLUX & KOOL Mμ® POWDER CORES

Molypermalloy Powder Cores (MPP) are available in ten permeabilities of 14 through 550, and have guaranteed inductance limits of ±8%. Insulation on the core is a high dielectric strength finish not affected by normal potting compounds and waxes. Twenty-nine sizes include IDs from 0.070" to 1.900" and ODs from 0.14" to 3.10". Standard cores include either temperature stabilized (as wide as -65°C to +125°C) or unstabilized.

High Flux Powder Cores have a higher energy storage capacity than MPP cores and are available in six permeabilities from 14 through 160. Kool Mμ, Powder Cores also have a high energy storage capacity, but are more economical than High Flux or MPP cores, and are available in five permeabilities from 26 through 125. Both types come in sizes identical to MPP cores. Kool Mμ cores are also available in E shapes, U shapes and blocks.

Powder Cores are excellent as low loss inductors for switch mode power supplies, switching regulators, and noise filters. Most core types can be shipped immediately from stock.

MPP THINZ™, are extremely low height (<1 mm) self shielded power inductor cores, allowing finished inductor heights in the 1.5 mm to 2 mm range. THINZ come in five sizes with ODs ranging from 0.120" through 0.310" and four permeabilities, 125μ, 160μ, 200μ, and 250μ.

For further information, view Powder Cores Design Manual and Catalog at www.mag-inc.com.

Applications: Inductors for High Q, Low Loss Filter Circuits, Loading Coils, Transformers, Chokes, and Inductors

FERRITE CORES

Ferrite Cores are manufactured for a wide variety of applications. Magnetics has developed and produces the leading MnZn ferrite materials for power transformers, power inductors, wideband transformers, common mode chokes, and many other applications. In addition to offering the leading materials, other advantages of ferrites from Magnetics include: the full range of standard planar E and I Cores; rapid prototyping capability for new development; the widest range of toroid sizes in power and high permeability materials; standard gapping to precise inductance or mechanical dimension; wide range of coil former and assembly hardware available; and superior toroid coatings available in several options.

POWER MATERIALS

Three low loss materials are engineered for optimum frequency and temperature performance in power applications. Magnetics' materials provide superior saturation, high temperature performance, low losses, product consistency.

SHAPES: E cores, Planar E cores, ETD, EC, U cores, I cores, PQ, Planar PQ, RM, Toroids (2mm to 86mm), Pot cores, RS (round-slab), DS (double slab), EP, Special shapes

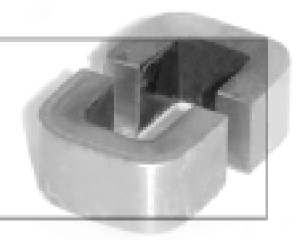
Applications: Telecomm Power Supplies, Computer Power Supplies, Commercial Power Supplies, Consumer Power Supplies, Automotive, DC-DC Converters, Telecomm Data Interfaces, Impedance Matching Transformers, Handheld Devices, High Power Control (gate drive), Computer Servers, Distributed Power (DC-DC), EMI Filters, Aerospace, Medical.

HIGH PERMEABILITY MATERIALS

Three high permeability materials (5,000μ, 10,000μ and 15,000μ) are engineered for optimum frequency and impedance performance in signal, choke and filter applications. Magnetics' materials provide superior loss factor, frequency response, temperature performance, and product consistency.

SHAPES: Toroids (2 mm to 86 mm), E cores, U cores, RM, Pot cores, RS (round-slab), DS (double slab), EP, Special shapes

Applications: Common Mode Chokes, EMI Filters, Other Filters, Current Sensors, Telecomm Data Interfaces, Impedance Matching interfaces, Handheld Devices, Spike Suppression, Gate Drive Transformers



CUSTOM COMPONENTS

Magnetics offers unique capabilities in the design and manufacture of specialized components fabricated from magnetic materials in many sizes and shapes.

Ferrites can be pressed in block form and then machined into intricate shapes. Where large sizes are required, it is possible to assemble them from two or more smaller machined or pressed sections. The variety of sizes and shapes is limitless.

Surface grinding	Hole drilling
Cutting, slicing, slotting	Special machining
ID and OD machining	Assembly of smaller parts

Without sacrificing magnetic properties, many operations can be performed on ferrites, while maintaining strict dimensional or mechanical tolerances:

In addition to machined ferrites, components for custom applications include unusual core configurations, both cut and uncut, wound from strip as thin as 0.000125".

Standard catalog items can also be modified, as needed, to fit your requirements.

Contact the Magnetics Sales Department for more information.

RAPID PROTOTYPING SERVICE

Magnetics' world-class materials offer unique and powerful advantages to almost any application. An even greater competitive edge can be gained through innovations in new core shapes and custom geometries, and Magnetics is poised to help. Our Rapid Prototyping Service can quickly make a wide variety of core shapes in ferrite, MPP, High Flux, or Kool Mµ®. Our rapid turnaround time results in a shorter design period, which gets your product to market faster. Plus, our Application Engineers may be able to provide design assistance that could lead to a lower piece price. To learn more about how our Rapid Prototyping Service can help you shorten your design cycle, contact a Magnetics Application Engineer.

WARRANTY

All standard parts are guaranteed to be free from defects in material and workmanship, and are warranted to meet the Magnetics published specification. No other warranty, expressed or implied, is made by Magnetics. All special parts manufactured to a customer's specification are guaranteed only to the extent agreed upon, in writing, between Magnetics and the user.

Magnetics will repair or replace units under the following conditions:

1. The buyer must notify Magnetics, Pittsburgh, PA 15238 in writing, within 30 days of the receipt of material, that he requests authorization to return the parts. A description of the complaint must be included.
2. Transportation charges must be prepaid.
3. Magnetics determines to its satisfaction that the parts are defective, and the defect is not due to misuse, accident or improper application.

Magnetics liability shall in no event exceed the cost of repair or replacement of its parts, if, within 90 days from date of shipment, they have been proven to be defective in workmanship or material at the time of shipment. No allowance will be made for repairs or replacements made by others without written authorization from Magnetics.

Under no conditions shall Magnetics have any liability whatever for the loss of anticipated profits, interruption of operations, or for special, incidental or consequential damages.

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STRIP WOUND CORES
- Tape Wound Cores
- Bobbin Cores
- Cut Cores
- Special Cores